AMENDMENTS TO THE CLAIMS

IN THE CLAIMS:

The amended claim set is as follows:

1. (Currently Amended) A method of conferring resistance to protoporphyrinogen oxidase-inhibiting herbicides upon plants or plant cells, comprising introducing a DNA fragment or a plasmid containing the DNA fragment into plants or plant cells or algal cells, wherein said DNA fragment is expressed and has the following characteristics:

(1) said DNA fragment ~~encodes a part of a protein, wherein said protein has protoporphyrinogen oxidase activity in plants~~ is 2.6 to 13.8 kb in length;

(2) said DNA fragment has a sequence that can be detected and isolated by DNA-DNA or DNA-RNA hybridization to a nucleic acid sequence that is complementary to a nucleotide sequence encoding ~~an~~ the amino acid sequence of SEQ ID NO:1, wherein said DNA-DNA or DNA-RNA hybridization occurs under 2X PIPES buffer, 50% deionized formamide, 0.5% (w/v) SDS, 500µg/ml denatured sonicated salmon sperm DNA at 42°C overnight; and said DNA fragment remains hybridized after washing in 2X SSC, 1% (w/v) SDS~~;~~, wherein said sequence

~~(3) said DNA fragment~~ encodes the part of the protein in which ~~an~~ the amino acid corresponding to ~~Val13~~ valine at

position 13 of SEQ ID NO:1~~,~~ which is substituted by another amino acid; and

(3) ~~(4)~~ said DNA fragment has an ability to confer resistance to protoporphyrinogen oxidase-inhibiting herbicides in plant or algal cells when expressed therein.

2. (Previously Amended) The method according to claim 1, wherein the plant is a dicot.

4. (Previously Amended) The method according to claim 1, wherein the plant is a monocot.

6. (Currently Amended) The method according to claim 1, wherein ~~said protein has protoporphyrinogen oxidase activity in~~ the plant is the green algae *Chlamydomonas*.

7. (Currently Amended) The method according to any one of claims 1, 2, 4, ~~or~~ 6, 43, 44, 45 or 46, wherein ~~Val13 or the corresponding amino acid~~ the amino acid corresponding to valine at position 13 of SEQ ID NO:1 is replaced by methionine.

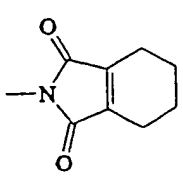
10. (Currently Amended) A plant or plant cells or green alga upon which resistance is conferred by the method described in any one of claims ~~claim~~ 1, 2, 4, 6, 7, 43, 44, 45 or 46.

11. (Currently Amended) A method of selecting plant or algal cells upon which resistance to protoporphyrinogen-inhibiting herbicides is conferred, which comprises treating a population of plant or algal cells, upon which resistance to protoporphyrinogen-inhibiting herbicides is conferred by the method as described in any one of claims ~~claim~~ 1, 2, 4, 6, 7, 43, 44, 45 or 46, with a protoporphyrinogen-inhibiting herbicide in an amount which normally blocks growth of said plant or algal cells expressing only herbicide-sensitive protoporphyrinogen oxidase.

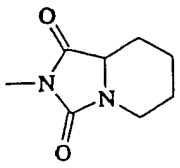
12. (Currently Amended) A method of controlling plants lacking resistance to protoporphyrinogen-inhibiting herbicides in cultivating fields of crop plants upon which resistance to protoporphyrinogen-inhibiting herbicides is conferred by the method as described in any one of claims ~~claim~~ 1, 2, 4, 6, 7, 43, 44, 45 or 46, which comprises applying to said field at least one protoporphyrinogen-inhibiting herbicide in effective amounts to inhibit growth of said plants lacking resistance to protoporphyrinogen-inhibiting herbicides.

13. (Currently Amended) The method of controlling ~~non-resistant~~ plants lacking resistance to protoporphyrinogen-

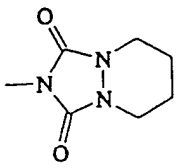
inhibiting herbicides according to claim 12, wherein the protoporphyrinogen-inhibiting herbicides to be applied are selected from the group of compounds of the formula X-Q, wherein Q is selected from the group consisting of:



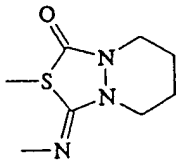
(Formula 1)



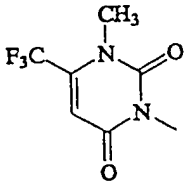
(Formula 2)



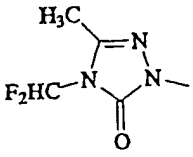
(Formula 3)



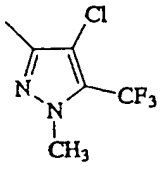
(Formula 4)



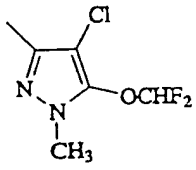
(Formula 5)



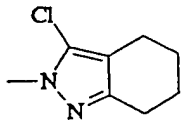
(Formula 6)



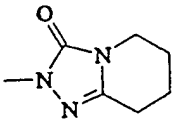
(Formula 7)



(Formula 8)

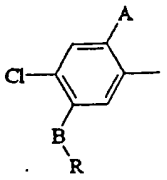


and



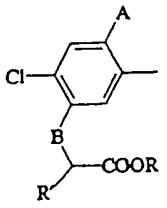
(Formula 9) (Formula 10)

and X is selected from the group consisting of



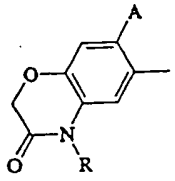
wherein
A = H, halogen
B = O, S
R = C_1-C_8 alkyl,
C_3-C_8 alkenyl,
C_3-C_8 alkynyl

(Formula 11)



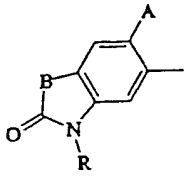
wherein
A = H, halogen
B = O, S
R' = H, CH_3
R = C_1-C_8 alkyl
C_3-C_8 alkenyl
C_3- C_8 alkynyl

(Formula 12)



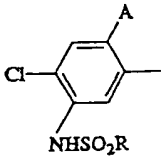
wherein
A = H, halogen
R = C_1-C_8 alkyl,
C_3-C_8 alkenyl,
C_3-C_8 alkynyl

(Formula 13)



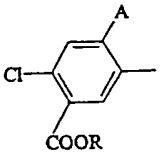
wherein
A = H, halogen
B = O, S
R = C_1-C_8 alkyl,
C_3-C_8 alkenyl,
C_3-C_8 alkynyl

(Formula 14)



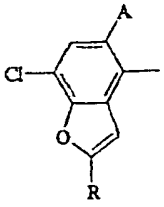
wherein
A = H, halogen
R = C_1-C_8 alkyl,
C_3-C_8 alkenyl,
C_3-C_8 alkynyl

(Formula 15)



wherein
A = H, halogen
R = C_1-C_8 alkyl,
C_3-C_8 alkenyl,
C_3-C_8 alkynyl

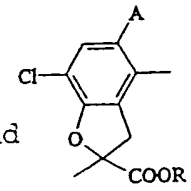
(Formula 16)



wherein
A = H, halogen
R = C_1-C_8 alkyl,
C_3-C_8 alkenyl,
C_3-C_8 alkynyl

(Formula 17)

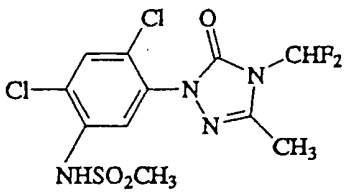
and



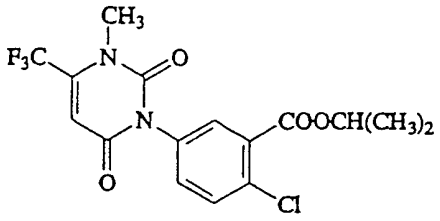
wherein
A = H, halogen
R = C_1-C_8 alkyl,
C_3-C_8 alkenyl,
C_3-C_8 alkynyl

(Formula 18)

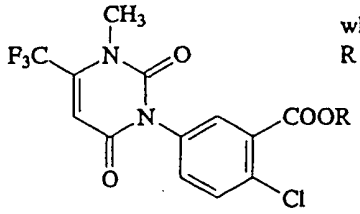
14. (Currently Amended) The method of controlling ~~non-resistant~~ plants lacking resistance to protoporphyrinogen-inhibiting herbicides according to claim 12, wherein the protoporphyrinogen-inhibiting herbicide to be applied is selected from the group consisting of the compounds of the formula:



(Formula 19)

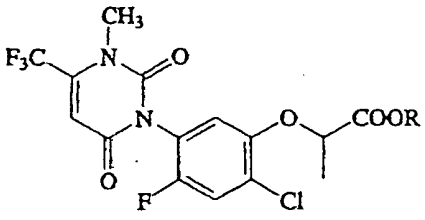


(Formula 20)



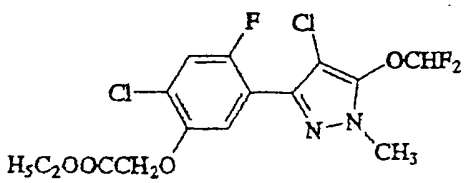
wherein
R = (C_2-C_5 alkenyloxy) C_1-C_4 alkyl

(Formula 21)



wherein
R = C_1-C_8 alkyl,
C_3-C_8 alkenyl,
C_3-C_8 alkynyl

(Formula 22)



(Formula 23)

lactofen,

[N-(4-chloro-2-fluoro-5-propargyloxy)phenyl-3,4,5,6-tetrahydrophthalimide,

pentyl[2-chloro-5-(cyclohex-1-ene-1,2-dicarboximido)-4-fluorophenoxy]acetate,

7-fluoro-6-[(3,4,5,6,-tetrahydro)phthalimido]-4-(2-propynyl)-1,4-benzoxazin-3(2H)-one,

6-[(3,4,5,6-tetrahydro)phthalimido]-4-(2-propynyl)-1,4-benzoxazin-3(2H)-one,

2-[7-fluoro-3-oxo-4-(2-propynyl)-3,4-dihydro-2H-1,4-benzoxazin-6-yl]perhydroimidazo[1,5-a]pyridine-1,3-dione,

2-[(4-chloro-2-fluoro-5-propargyloxy)phenyl] perhydro-1H-1,2,4-triazolo-[1,2-a]pyridazine-1,3-dione,

2-[7-fluoro-3-oxo-4-(2-propynyl)-3,4-dihydro-2H-1,4-benzoxazin-6-yl]5,6,7,8-1,2,4-triazolo[4,3-a]pyridine-3H-one,

2-[3-oxo-4-(2-propynyl)-3,4-dihydro-2H-1,4-benzoxazin-6-yl]-1-methyl-6-trifluoromethyl-2,4(1H,3H)-pyrimidinedione,

2-[6-fluoro-2-oxo-3-(2-propynyl)-2,3-dihydrobenzthiazol-5-yl]-3,4,5,6-tetrahydrophthalimide, and

1-amino-2-[3-oxo-4-(2-propynyl)-3,4-dihydro-2H-1,4-benzoxazin-6-yl]-6-tri-fluoromethyl-2,4(1H,3H)-pyrimidinedione.

15. (Currently Amended) An isolated DNA fragment which has the following characteristics:

(1) said DNA fragment ~~encodes a part of a protein, wherein said protein has protoporphyrinogen oxidase activity in plants~~ is 2.6 to 13.8 kb in length;

(2) said DNA fragment has a sequence that can be detected and isolated by DNA-DNA or DNA-RNA hybridization to a nucleic acid sequence that is complementary to a nucleotide sequence encoding ~~an~~ the amino acid sequence of SEQ ID NO:1, wherein said DNA-DNA or DNA-RNA hybridization occurs under 2X PIPES buffer, 50% deionized formamide, 0.5% (w/v) SDS, 500µg/ml denatured sonicated salmon sperm DNA at 42°C overnight; and

said DNA fragment or its complement remains hybridized after washing in 2X SSC, 1% (w/v) SDS~~;~~, wherein said sequence

~~(3) said DNA fragment~~ encodes the ~~part of said protein in which an~~ amino acid corresponding to ~~Val13~~ valine at position 13 of SEQ ID NO:1 which is substituted by another amino acid; and

(3) ~~(4)~~ said DNA fragment has an ability to confer resistance to protoporphyrinogen oxidase-inhibiting herbicides in plant or algal cells when expressed therein.

16. (Previously Amended) The isolated DNA fragment according to claim 15, wherein the plant is a dicot.

18. (Previously Amended) The isolated DNA fragment according to claim 15, wherein the plant is a monocot.

20. (Previously Amended) The isolated DNA fragment according to claim 15, wherein the plant is the green alga Chlamydomonas and the DNA fragment encodes an amino acid sequence resulting from replacement of Val13 of SEQ ID NO:1 by another amino acid.

21. (Currently Amended) The isolated DNA fragment according to any of claims 15, 16, 18, ~~and~~ 20~~,~~ and 47, wherein said another amino acid is methionine.

22. (Currently Amended) The isolated DNA fragment according to claim 20, wherein the DNA fragment ~~has a sequence that can be~~ is isolated from genomic DNA of *Chlamydomonas*, ~~the DNA fragment encodes a protein or a part of the protein, wherein the protein has protoporphyrinogen oxidase activity,~~ and a nucleotide corresponding to guanine at position 37 (G37) of SEQ ID NO:4 is replaced with another nucleotide.

23. (Previously Amended) The isolated DNA fragment according to claim 22, wherein said another nucleotide is adenine.

24. (Previously Amended) A plasmid comprising the DNA fragment described in claim 15.

43. (New) The method of conferring resistance to protoporphyrinogen oxidase-inhibiting herbicides upon plants or plant cells or algal cells of claim 1, wherein said DNA fragment is 2.6 to 3.4 kb in length.

44. (New) The method of conferring resistance to protoporphyrinogen oxidase-inhibiting herbicides upon plants or plant cells or algal cells of claim 1, wherein said DNA fragment is 2.6 to 10.0 kb in length.

45. (New) The method of conferring resistance to protoporphyrinogen oxidase-inhibiting herbicides upon plants or plant cells or algal cells of claim 1, wherein said DNA fragment is obtained from a genomic DNA of a plant, a plant cell or an algal cell.

46. (New) The method of conferring resistance to protoporphyrinogen oxidase-inhibiting herbicides upon plants or plant cells or algal cells of claim 1, wherein said DNA fragment is obtained from an algal cell.

47. (New) The isolated DNA fragment according to claim 15, wherein said DNA fragment is 2.6 kb in length.